

What Works Clearinghouse



Early Childhood Education

March 12, 2007

Words and Concepts

Program description *Words and Concepts* is a computer software program that focuses on building oral language skills related to vocabulary, comprehension, word relationships, and other concepts in six units—vocabulary, categorization, word identification by function, word association, concept of same, and concept of

different. It can be used by adults and children with varying special needs, including language-learning disabilities, developmental disabilities, physical impairments, hearing and vision impairments, and autism.

Research One study of *Words and Concepts* met the What Works Clearinghouse (WWC) evidence standards.¹ This study included 78 preschool children from Roanoke, Virginia, and examined intervention effects (that is, *Words and Concepts* either with or without enhanced interactions versus a comparison group) on children's

oral language. The children studied were from economically disadvantaged families, and some received additional speech-language services—a clinician provided lessons focused on improving speech—at the time of the study. This report focuses on immediate posttest findings to determine the effectiveness of the intervention.²

Effectiveness *Words and Concepts* was found to have no discernible effects on oral language.

	<i>Oral language</i>	<i>Print knowledge</i>	<i>Phonological processing</i>	<i>Early reading/writing</i>	<i>Cognition</i>	<i>Math</i>
Rating of effectiveness	No discernible effects	na	na	na	na	na
Improvement index³	Average: +4 percentile points Range: +1 to +8 percentile points	na	na	na	na	na

na = not applicable

1. To be eligible for the WWC's review, the Early Childhood Education (ECE) intervention had to be implemented in English in center-based settings with children ages 3 to 5 or in preschool.
2. The evidence presented in this report is based on available research. Findings and conclusions may change as new research becomes available.
3. These numbers show the average and range of improvement indices for all findings across the study.

Additional program information

Developer and contact

The *Words and Concepts* series (*Words and Concepts I, II, and III*) is available through Laureate Learning Systems, Inc. Address: 110 East Spring Street, Winooski, VT 05404-1898. Email: info@llsys.com. Web: <http://www.llsys.com/professionals602/products/descriptions/wcdesc.html>. Telephone: (800) 562-6801.

Scope of use

The current version of the *Words and Concepts* program (Mac/Win CD) was released in December 1997. (The version of the program reviewed in this report was released before 1994, and later studies of more recent versions of the program were not identified.) Previous versions were released in 1988 (Apple IIe), 1991 (Apple IIGS), and 1994 (Mac disc). More than 6,000 units of the Mac/Win CD version have been sold. The *Words and Concepts* program is used with students in preschool through high school. Information is not available on the number or demographics of children or centers using this program.

Teaching

The *Words and Concepts* series (*Words and Concepts I, II, and III*) is commercially available computer software containing graphics, animation, digitized speech, and optional text that is

used to teach children six language units—vocabulary, categorization, word identification by function, word association, and the concepts of same and different—in each of the three levels. Although each level of the series contains the same language units, the nouns used at each level vary in their difficulty (for example, Level I uses 40 early developing nouns whereas Level III uses 40 higher-level nouns). For each unit (except for categorization) within each level of the series, training is available for the children. The software can be programmed to work on a single level or on multiple levels, depending on the progress of the child using the software. Teachers can obtain text for beginning readers and can use keyboards, touch screens, or a mouse to access the program. Teachers can access on-line and telephone support and review the product monograph available on the website. In this study, children used the *Words and Concepts* software in pairs.

Cost

The *Words and Concepts* series is available in three levels. Sold separately, each level costs \$230 per copy of the software program plus a network license rate of \$1,150. As a package, the three levels cost \$517 plus a network license rate of \$2,585. Multiple copies can be purchased at a reduced price.

Research

One study reviewed by the WWC investigated the effects of *Words and Concepts* in center-based settings. The study (Schetz, 1994) was a randomized controlled trial that met WWC evidence standards.

Schetz (1994) included 78 four-year-old low-income children attending five Head Start classes in Roanoke, Virginia. The study compared oral language outcomes for children participating in two intervention groups—the *Words and Concepts* series with enhancement (that is, software with programmed instructional interaction with a speech-language clinician) and the *Words and*

Concepts series without enhancement (that is, software without the programmed instructional component)—with children in a no-treatment comparison group who received language enrichment from their regular Head Start curriculum. Because the WWC is interested in the overall effectiveness of *Words and Concepts* and not the mode with which it was implemented, the WWC combined the two intervention groups into one group and derived the rating of effectiveness by comparing the oral language outcomes between the combined group and the no-treatment comparison group.⁴ Schetz (1994) conducted a separate

4. The data separated for these two groups are described in the findings section and are included in Appendix A4. The WWC recognizes that this is a different use of the data than intended by the study author, but combining the groups better addresses intervention effectiveness, which is a main task for the WWC.

Research *(continued)*

analysis comparing the outcomes between the two intervention groups—comparison of *Words and Concepts* with enhancement to *Words and Concepts* without enhancement—which does not allow the effects of *Words and Concepts* to be determined but

does test the effects of using enhancement with the program. The results from this separate analysis do not factor into the intervention ratings, but are discussed separately and presented in Appendices A5.1 and A5.2.

Effectiveness Findings

The WWC review of interventions for early childhood education addresses children's outcomes in six domains: oral language, print knowledge, phonological processing, early reading/writing, cognition, and math.⁵

Oral language. Schetz (1994) reported findings for two measures in the oral language domain. The WWC analysis indicated that the findings favored the combined intervention group for both measures, but neither of the effects was statistically significant nor large enough to be considered substantively important. In this study, the effect of *Words and Concepts* on oral language was indeterminate, according to WWC criteria.⁶

Schetz (1994) analyzed group differences to compare the *Words and Concepts* with enhancement group with the comparison group and the *Words and Concepts* without enhancement group

with the comparison group. For both comparisons, the author reported no statistically significant differences on either measure.

In sum, one study that examined the effects of *Words and Concepts* on oral language showed indeterminate effects, according to WWC criteria.

Rating of effectiveness

The WWC rates the effects of an intervention in a given outcome domain as positive, potentially positive, mixed, no discernible effects, potentially negative, or negative. The rating of effectiveness takes into account four factors: the quality of the research design, the statistical significance of the findings,⁵ the size of the difference between participants in the intervention and the comparison conditions, and the consistency in findings across studies (see the [WWC Intervention Rating Scheme](#)).

The WWC found *Words and Concepts* to have no discernible effects for oral language

Improvement index

The WWC computes an improvement index for each individual finding. In addition, within each outcome domain, the WWC computes an average improvement index for each study and an average improvement index across studies (see [Technical Details of WWC-Conducted Computations](#)). The improvement index represents the difference between the percentile rank of the average

student in the intervention condition versus the percentile rank of the average student in the comparison condition. Unlike the rating of effectiveness, the improvement index is entirely based on the size of the effect, regardless of the statistical significance of the effect, the study design, or the analyses. The improvement index can take on values between -50 and +50, with positive numbers denoting results favorable to the intervention group.

5. The level of statistical significance was reported by the study author or, where necessary, calculated by the WWC to correct for clustering within classrooms or schools and for multiple comparisons. For an explanation about the clustering correction, see the [WWC Tutorial on Mismatch](#). See [Technical Details of WWC-Conducted Computations](#) for the formulas the WWC used to calculate the statistical significance. In the case of *Words and Concepts*, no corrections for clustering or multiple comparisons were needed.
6. Schetz (1994) conducted two additional analyses (one comparing effects on high- and low-functioning children, the other estimating effects after excluding children receiving speech services). The author tested the interaction between treatment and level of functioning and found that there was no significant interaction. So, detailed findings for the lower and higher functioning subgroups are not included in the technical appendices. However, results for the Preschool Language Assessment Instrument (PLAI-I) suggest that *Words and Concepts* may be particularly useful for low-functioning children. The author also reestimated intervention effects excluding children receiving speech services and found that the results are not sensitive to the inclusion of children receiving speech services (that is, these analyses also showed no significant effects of the intervention).

The WWC found *Words and Concepts* to have no discernible effects for oral language *(continued)*

The average improvement index for oral language is +4 percentile points for the one study, with a range of +1 to +8 percentile points across findings.

Findings for comparisons between *Words and Concepts* with enhancement and *Words and Concepts* without enhancement

The comparison described below does not contribute to the overall rating of effectiveness because it involves two different implementations of *Words and Concepts*, which does not allow the effects of *Words and Concepts* to be determined. However, the WWC believes that the findings from this comparison provide useful information to practitioners who may be interested in comparing the effects of different implementations of the same program. The WWC reports the findings from this comparison here and in Appendices A5.1 and A5.2.

Oral language. Schetz (1994) analyzed findings for two measures in this outcome domain, but did not report statistically significant differences between the enhancement group and the no enhancement group for either measure. The average improvement index for oral language is –4 percentile points, with a range of –8 to +1 percentile points across findings.

Summary

The WWC reviewed one study on *Words and Concepts* and it met WWC evidence standards. Based on this study, the WWC found no discernible effects for oral language. Findings also suggest that implementing *Words and Concepts* with or without enhanced interactions with a clinician does not influence the impact of the program on children’s oral language skills. The evidence presented in this report may change as new research emerges.

References

Met WWC evidence standards

Schetz, K. F. (1994). An examination of software used with enhancement for preschool discourse skill improvement. *Journal of Educational Computing Research*, 11(1), 51–71.

Additional source:

Schetz, K. F. (1992). Preschool discourse skill improvement with computer-assisted instruction. *Dissertation Abstracts International*, 52(11), 3821-3822A. (UMI No. 9208433).

For more information about specific studies and WWC calculations, please see the WWC *Words and Concepts* Technical Appendices.